# SAS 609E TS450

Number: 260
Issued Date: February 25, 1998
Effective Date: February 25, 1998
Section/Groups: Production Support Services
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After three months of testing, Information Technology Services (ITS) implemented SAS 609E TS450 on February 15, 1998. The SAS and GPSAS PROCLIB members, as well as the Online SAS PROC, have been updated to use this new release.

This technical bulletin attempts to highlight some of the functionality added to Release 6.09E of the SAS System in the MVS environment and where this information is documented. This is not an exhaustive list but points out many of the new features added during the life of Release 6.08 on MVS, discusses portable enhancements added to Releases 6.09, 6.10, and 6.11 of the SAS System on other operating systems which have been backported to Release 6.09E of the SAS System on the MVS platform, and MVS specific features added between Release 6.08 and 6.09E.

Currently the following SAS Products are available:

- Base SAS Software
- SAS/ACCESS Software for ADABAS
- SAS/ETS Software
- SAS/GRAPH Software
- SAS/STAT Software

The following will be implemented as it becomes available:

- Technical Support Release 455 (TS455) Updated Information—13Oct97

Complete documentation is available for purchase from the SAS Institute. The URL for their publications site is: http://www.sas.com/service/doc/pubcat/uspubcat.html. The order numbers for suggested documentation have been included in this bulletin for your convenience.

# Base SAS Software

## Primary Documentation

- SAS Language: Reference, Version 6, First Edition (Order #56076)
- SAS Procedures Guide, Version 6, Third Edition (Order #56080)
- SAS Companion for the MVS Environment, Version 6, Second Edition (Order #55108)

## Additional Documentation

- SAS Technical Report P-222, Changes and Enhancements to Base SAS Software, Release 6.07 (Order #59139)
- SAS Technical Report P-242, Changes and Enhancements, Release 6.08 (Order #59159)
- What's New for the 6.09 Enhanced Release of SAS Software: Changes and Enhancements (Order #55569)
- SAS Guide to Macro Processing, Version 6, Second Edition (Order #56041)
- SAS Guide to the REPORT Procedure: Reference, Release 6.11 (Order #55323)
- SAS Technical Report P-258, Using the REPORT Procedure in a Nonwindowing Environment, Release 6.07 (Order #59175)
- SAS Guide to the SQL Procedure: Usage and Reference, Version 6, First Edition (Order #56070)
- SAS Guide to the SQL Query Window: Usage and Reference, Version 6, First Edition (Order #55342)
- SAS Guide to TABULATE Processing, Second Edition (Order #56095)
- SAS Guide to VSAM Processing, Version 6, First Edition (Order #56042)
- SAS Technical Report P-195, Transporting SAS Files between Host Systems (Order #59112)

## New Features

### DATA Step Debugger

The DATA Step Debugger is a part of base SAS software that consists of windows and a group of commands. By issuing commands, you can execute DATA step statements slowly and pause at any point to display the resulting variable values in a window. By observing the results displayed, you can determine where the logic error lies. To invoke the debugger, add the DEBUG option to the DATA statement.

The DATA Step Debugger allows you to perform the following actions:

- execute statements one by one or in groups;
- bypass execution of one or more statements;
- suspend execution at selected statements, either in each iteration of the DATA step or

based on a condition, and resume execution on command;
- monitor the values of selected variables and suspend execution to them at the point a value changes;
- display the values of variables and assign new values;
- receive help on individual debugger commands;
- assign debugger commands to function keys; and,
- use the macro facility to generate customized debugger commands.

For more information, see *What's New for the 6.09 Enhanced Release of SAS Software: Changes and Enhancements*

**Macro Facility**

Two new automatic macro variables have been added: SYSSITE, which contains your site number, and SYSSCPL, which contains the name of your host operating system.

New operands on the %PUT statement tell SAS to write information about macro variables to the SAS log. You select the group of macro variables you want by including one of the following arguments: _ALL_, _AUTOMATIC_, _GLOBAL_, _LOCAL_, or _USER_. The information generated includes the scope, the name of the macro variable, and the macro variable's value.

Also the %DISPLAY statement now supports the DELETE option.

Additionally, the RESERVEDB1 SAS system option determines whether MPRINT output is routed to an external file.

For more information, see *What's New for the 6.09 Enhanced Release of SAS Software: Changes and Enhancements*.

**Data Set Options**

PWREQ= determines if a requestor window appears when the user has not supplied the correct password for a SAS data set that is password protected.

SORTEDBY= specifies how the data set is currently sorted.

For more information, see *What's New for the 6.09 Enhanced Release of SAS Software: Changes and Enhancements* and *SAS Technical Report P-222, Changes and Enhancements to Base SAS Software, Release 6.07*.

**SAS System Options**

CBUFNO= controls the number of extra page buffers to allocate for each open SAS catalog.

BLKALLOC controls whether the LRECL and BLKSIZE values for a SAS data library are set when it is allocated or when it is first accessed.

ICSRSLV=enables sites that use Interlink TCP/IP to specify when or if the ICS name resolver is called to translate an IP address to a name.

TCPIPMCH= specifies which TCP/IP to use.

For more information, see *What's New for the 6.09 Enhanced Release of SAS Software: Changes and Enhancements* and *SAS Companion for the MVS Environment, Version 6, Second Edition* or Host Help.

## Base SAS Procedures

### FREQ Procedure

The FREQ procedure now computes measures of agreement, including the kappa statistic (simple and weighted), McNemar's test, Cochran's Q test, and Bowker's test of symmetry. The FREQ procedure also computes the polychoric (and tetrachoric) correlation coefficient. You can output any statistic to a SAS data set using the OUTPUT statement. In addition, you can now output expected frequencies as well as row, column, and table percentages in the OUT= data set.

For more information, see *What's New for the 6.09 Enhanced Release of SAS Software: Changes and Enhancements*.

### PLOT Procedure

The PLOT procedure now supports the OUTWARD= option to force the point labels outward, away from the origin of the plot.

For more information, see *What's New for the 6.09 Enhanced Release of SAS Software: Changes and Enhancements*.

### REPORT Procedure

The enhancements to PROC REPORT include the BOX option for boxing in your output, the ID option on the DEFINE statement, the VARDEF option and the NOEXEC option on the PROC REPORT statement. It is also now possible to create an output data set from PROC REPORT where each observation represents one row of the report and each variable represents a column. The PCTN and PCTSUM are two new calculating additions. A new prompting mechanism displays the output after any one decision rather than waiting for all decisions to be made.

Finally, revisions to the PMENUs and the added capability of double clicking in different sections of the REPORT window make use of the interactive REPORT window more understandable and flexible.

For more information, see *What's New for the 6.09 Enhanced Release of SAS Software: Changes and Enhancements* and *SAS Guide to the REPORT Procedure: Reference, Release 6.11* or Help for Report Writing.

**SQL Procedure**

New dictionary tables for MACROS and TITLES are now available. Dictionary tables are special read-only PROC SQL objects that retrieve information about all of the SAS data libraries, SAS data sets, SAS system options, SAS macros, and external files that are associated with the current SAS session. You can use a PROC SQL query to retrieve or subset data from a dictionary table. You can save that query as a PROC SQL view for use later. Or, you can use SASHELP views that are created from the dictionary tables. The following dictionary tables are available: CATALOGS, COLUMNS, EXTFILES, INDEXES, MACROS, MEMBERS, OPTIONS, TABLES, TITLES, and VIEWS.

There have also been updates to the host variable component of the SQL procedure that allows you to store the value of one or more columns for later use in another PROC SQL query or SAS procedure. There are now three forms of the INTO:macro-variable clause. One form, introduced in Release 6.06, creates a macro variable based on the first row of the result. A 6.09E form creates one new macro variable per row in the result of the SELECT statement. Another 6.09E form takes the values of a column and concatenates them all together into one macro variable.

For more information, see *What's New for the 6.09 Enhanced Release of SAS Software: Changes and Enhancements*.

**OpenEdition MVS Support**

OpenEdition MVS is an addition to the MVS/ESA operating system that brings UNIX compatibility to MVS. OpenEdition MVS includes the OpenEdition shell and the Hierarchical File System (HFS). The HFS is a directory-based file system very similar to the file systems used in UNIX. This release of the SAS System under MVS includes support for reading and writing files in the Hierarchical File System, piping data between the SAS System and OpenEdition MVS commands, and issuing a number of OpenEdition shell commands through the X statement.

For more information, see *SAS Companion for the MVS Environment, Version 6, Second Edition* or Host Help.

**SAS Block Sort Interface**

TS450 announces production support for block mode access to external sort programs. This interface is currently supported by IBM's DFSORT Version 1, Release 13. The SAS System under MVS works in conjunction with the external sort program to process your SAS sorting applications faster, significantly reducing CPU time. Both PROC SORT and PROC SQL sorting applications take advantage of this new interface.

For more information, see *SAS Companion for the MVS Environment, Version 6, Second Edition* or Host Help.

**ISPF Interface**

With the ISPF interface, you can write ISPF dialogs using the SAS DATA step language to make ISPF service requests using the ISPLINK and ISPEXEC functions. You can share SAS DATA step variables with ISPF, and use the power and versatility of SAS formats and informats when ISPF accesses those variables. You can also browse or edit the contents of SAS editor windows (Program Editor, Log, Output, Notepad, SCL Source Editor, etc.) with ISPF Browse or Edit by using the new HOSTEDIT SAS Display Manager Command. The ISPF Interface replaces the previous Version 5 product, SAS/DMI.

For more information, see *SAS Companion for the MVS Environment, Version 6, Second Edition* or Host Help.

**REXX Interface**

REXX, the procedure language for computing platforms that conform to the IBM Systems Application Architecture (SAA), is well known for combining powerful programming features with ease of use. Users of the SAS System under MVS can now exploit the capabilities of REXX. Supplementing the SAS language with REXX encourages new SAS System programming possibilities in the MVS environment.

For more information, see *SAS Companion for the MVS Environment, Version 6, Second Edition* or Host Help

## SAS/ACCESS Software

## Primary Documentation

- SAS/ACCESS Interface to ADABAS: Usage and Reference, Version 6, First Edition (Order #56065)

## New Features

None.

# SAS/ETS Software

## Primary Documentation

- SAS/ETS User's Guide, Version 6, Second Edition (Order #56010)

## Additional Documentation

- SAS/ETS Software: Changes and Enhancements, Release 6.11 (Order #55474)
- SAS/ETS Software: Time Series Forecasting System, Version 6, First Edition (Order #55476)

## New Features

Release 6.09E of the SAS System updates SAS/ETS software to the 6.11 level, incorporating new features and enhancements that have been introduced since *SAS/ETS User's Guide, Version 6, Second Edition* was published. The technical report *SAS/ETS Software: Changes and Enhancements: Release 6.11* contains documentation on the enhancements. The following describes the new features.

The AUTOREG procedure now includes:

- a TEST statement to test linear hypotheses about the parameter estimates;
- a RESTRICT statement to impose linear constraints on parameter estimates;
- Chow tests and predictive Chow tests;
- a new HETERO statement to model heteroscedasticity as a function of variables;
- support for GARCH models with the conditional *t* error distribution;
- several different forms of the GARCH in mean model;
- GARCH models with Nelson and Cao inequality constraints;
- new features to estimate or specify starting values for GARCH parameters;
- Phillips-Perron unit root tests and Phillips-Ouliaris cointegration tests;
- a Lagrange multiplier test for heteroscedasticity;
- Godfrey's LM test for autocorrelation;
- Ramsey's RESET test;
- the Jarque-Bera normality test;
- recursive residuals and BLUS residuals;
- CUSUM and CUSUMSQ statistics and their confidence bounds;
- the linearized Durbin-Watson test for residual autocorrelation;
- improved computational algorithms;
- more efficient calculation of Durbin-Watson *p*-values; and,
- exact gradients used for GARCH model estimation.

The DATASOURCE procedure now supports access to FAME Information Services databases.

The KEEP and RENAME statements now allow quoted strings for series names; this is useful when series names in the input database are not valid SAS variable names.

The MODEL procedure now includes:

- a TEST statement to perform hypothesis tests for nonlinear functions of the parameter estimates;
- a BOUNDS statement to impose bounds on the parameter estimates;
- a RESTRICT statement to impose both nonlinear equality and nonlinear inequality restrictions on the parameter estimates;
- an ESTIMATE statement to print estimates, standard errors, and covariances for nonlinear functions of the parameters (the %PDL macro now uses the ESTIMATE statement to report the estimated lag coefficients);
- White's test and the Breusch-Pagan test for heteroscedastic errors;
- Godfrey's test for serial correlation of the residuals;
- the MISSING=PAIRWISE option to retain information when only some equations of a multivariate system contain missing values;
- the capability to use expressions on the left-hand side of the equal sign to write the model equations;
- LAG and ZLAG functions that allow the lag length to be specified as a variable rather than a constant;
- the MOVAVE function to compute moving averages of lagged values;
- SEIDEL and JACOBI methods for general form equations; and,
- the MEMORYUSE option to print information on the amount of memory the procedure uses.

The STATESPACE procedure now supports the NOPRINT option.

The SYSLIN procedure now includes the FIML estimation method for use with TEST, RESTRICT, STEST, and SRESTRICT statements.

The X11 procedure now includes:

- the SSPAN statement to perform sliding spans analysis;
- the NOINT and CENTER options in the ARIMA statement; and,
- two additional tests for moving and combined seasonality.

The new ALIGN= option aligns dates within intervals. SAS date values used to identify time series observations are normally aligned with the beginning of the time intervals corresponding to the observations. For example, dates for monthly data are normally set to the first day of the month. The ARIMA, DATASOURCE, EXPAND, and FORECAST procedures now provide an ALIGN= option to control the alignment of dates for output time series observations. You can request beginning, middle, or end of period dates. In addition, the INTNX function now supports

an optional argument to specify the alignment of the returned date value.

The new PROBDF function calculates significance probabilities for Dickey-Fuller tests for unit roots in time series. The PROBDF function can be used wherever SAS library functions are used, including DATA step programs, SCL programs, and PROC MODEL programs. In addition, note that SAS/IML software now includes four new subroutines for Kalman filters that will be of interest to many SAS/ETS users, as well as a library of TIMSAC subroutines.

For more information, see *SAS/IML Software: Changes and Enhancements through Release 6.11*.

# SAS/GRAPH Software

## Primary Documentation

- SAS/GRAPH Software: Reference, Version 6, First Edition Volumes 1 and Volume 2 (Order #56020)

## Additional Documentation

- SAS Technical Report P-215, SAS/GRAPH Software: Changes and Enhancements, Release 6.07 (Order #59132)
- SAS Technical Report P-231, SAS Software: Summary of Changes and Enhancements, Release 6.07 (Order #59148)
- SAS Technical Report P-242, SAS Software: Changes and Enhancements, Release 6.08 (Order #59159)
- What's New for the 6.09 Enhanced Release of SAS Software: Changes and Enhancements (Order #55569)
- SAS/GRAPH Software: Graphics Editor, Version 6, First Edition (Order #56023)
- SAS Technical Report P-196, SAS/GRAPH Software: Map Data Sets, Release 6.06 (Order #59113)
- SAS Technical Report P-208, SAS/GRAPH Software: Changes and Enhancements to Map Data Sets, Release 6.07 (Order #59125)
- SAS Technical Report P-170, Type Styles and Fonts for Use with SAS/GRAPH Software (Order #5961)
- SAS/GRAPH Software: Using Graphics Devices in the MVS Environment, Version 6, First Edition (Order #56025)

## New Features

We have an experimental driver for users who want to create GIF files on the mainframe to download to the WEB, PCs, etc. The experimental driver name is GIF. You will typically use the GIF driver in Release 6.09E to create a Graphics Stream File to then download or transfer to another platform.On MVS, this would typically be done as follows:

```
filename gifout ‘mvs.filename’ recfm=vb lrecl=132;
goptions device=gif gsfname=gifout gsflen=128 gsfmode=replace;
proc gtestit pic=1; run;
```

The default GPROTOCOL is SASGPASC, so users should download or transfer the GIF file as a binary file (i.e., "as is").

The following new map data sets have been added to the map data library: CYPRUS, EGYPT, IRAN, IRAQ, MACAU, MONGOLIA, NEPAL, POLAND, SAUDI, and SINGAPOR.

This release also offers new device drivers for PostScript devices with ISO 8859 Mods and PostScript devices with ISO Latin1 Encoding.

For more information, see *What's New for the 6.09 Enhanced Release of SAS Software: Changes and Enhancements*.

# SAS/STAT Software

## Primary Documentation

- SAS/STAT Users Guide, Fourth Edition, Volumes 1 and Volume 2 (Order #56045)
- SAS/STAT Software: Changes and Enhancements through Release 6.11 (Order #55356)

## New Features

Release 6.09E of the SAS System updates SAS/STAT software to the 6.11 level, incorporating new features and enhancements that were introduced in the 6.10 and 6.11 releases. Complete documentation for the software is included in *SAS/STAT Software: Changes and Enhancements Through Release 6.11*. This report contains the SAS/STAT documentation for all features not documented in the *SAS/STAT User's Guide, Version 6, Fourth Edition, Volumes 1 and 2*. An appendix contains a list of features and the releases in which they were introduced.

The following are highlights of the new features:

**PROC CALIS**—The optimization routines in the CALIS procedure have been updated to include the techniques available in the NLP procedure of SAS/OR software.

**PROC FREQ**—The new AGREE option computes simple and weighted kappa coefficients, which measure classification agreement. This option also provides McNemar's test, Bowker' s test of symmetry, and Cochran's Q test.

**PROC GENMOD**—The GENMOD procedure has been enhanced to produce standardized Pearson residuals, standardized deviance residuals, and likelihood residuals. You can now use input data set variables in user-defined link and distribution computations, and you can suppress the printing of individual tables in the output.

**PROC GLM**—The GLM procedure now includes a method for doubly multivariate repeated measures analysis; the MEAN option in the REPEATED statement now prints the means of within-subject repeated effects. The LSMEANS statement has been enhanced with new options that enable you to perform multiple comparisons of least-squares means, test for simple effects, and alter the balancing across classification variables and the coefficients for covariates.

**PROC LIFETEST**—You can now specify the time limit used in the estimation of the mean survival time and its standard error. The mean survival time can be shown to be the area under the Kaplan-Meier survival curve. However, if the largest observed time in the data is censored, the area under the survival curve is not a closed area. In such a situation, you can choose a time limit *L* and estimate the mean survival curve limited to *L*.

**PROC LOGISTIC**—The LOGISTIC procedure now includes a TEST statement to test linear

combinations of regression parameters, a UNITS statement to customize odds ratios, and profile likelihood confidence limits for parameters and odds ratios. Other enhancements include improved diagnostics for detecting infinite parameters and ROC statistics. In addition, you can now set initial values for model parameters and intercepts, as well as specify the name of an offset variable. With events/trials syntax, the Williams method of modeling overdispersion is available. Other enhancements include the option of choosing either Fisher scoring or Newton-Raphson as the optimization technique, as well as the capacity to request that weights specified in the WEIGHT statement be normalized to the actual sample size.

**PROC MIXED**—The MIXED procedure includes improved degrees-of-freedom calculations and supports new types of heterogeneous covariance structures including autoregressive-heterogeneous, Huynh-Feldt, and factor-analytic structures. The LSMEANS statement has been enhanced in the same manner as for the GLM procedure. In addition, the HUBER option in the PROC MIXED statement computes "sandwich" variance estimators for the fixed effects. Hotelling-Lawley multivariate statistics are available in conjunction with REPEATED / TYPE=UN analyses. New covariance structures are ANTE(1), TOEPH, and UNR. The PRIOR statement enables you to carry out a sampling-based Bayesian analysis in PROC MIXED. More information criteria are available, as are predicted means that do not include the empirical BLUP values.

**PROC NPAR1WAY**—The NPAR1WAY procedure now computes exact *p*-values for the location tests that use simple linear rank statistics. These include tests based on Wilcoxon scores, median scores, Savage scores, and Van der Waerden scores. These exact probabilities are requested by using the new EXACT statement and specifying the same keywords as you use to specify the tests in the PROC statement: WILCOXON, MEDIAN, SAVAGE, and VW.

**PROC PHREG**—The PHREG procedure now offers a counting process type of input, the Anderson-Gill generalization of Cox's model to handle recurrent events, and survival estimates based on the empirical hazard function. Other enhancements include Schoenfeld and score residuals, influence diagnostics, confidence limits for the baseline survivor function, and an OFFSET variable.

**PROC REG**—The plots produced by the REG procedure have been updated so that you can produce graphical output (versus line printer) plots by specifying the GRAPHICS option in the PROC REG statement.

**PROC TRANSREG**—PROC TRANSREG now prints and outputs confidence limits on the parameter estimates. In addition, individual and mean confidence limits can be output. Also, PROC TRANSREG provides a variety of ANOVA and linear model codings including reference cell, deviations from means (effects or 1,0,-1), cell mean, less than full rank, and separate slopes and intercepts.

# Technical Support Release 455 (TS455) Updated Information

As part of our ongoing commitment to provide quality software to mainframe users, SAS Institute offers Release 6.09 Enhanced (TS455) of the SAS System. This maintenance release was offered in August of 1997. The following list offers a brief overview of the exciting features that are included in Release 6.09 Enhanced (TS455):

- Web Publishing Tools enhance the functionality of your current SAS products by enabling you to format your SAS data and output for Web viewing. These tools create static Web pages that make your SAS data and procedure output available to the users of your corporate intranet, as well as World Wide Web users. Tools include the HTML method for the Table Editor to transform tables that you view in the Table Editor into tables that you can view through a table-enabled Web browser. Additionally, the HTML Formatting Tools offer a collection of macros that enable you to format your SAS datasets and procedure output into HTML-formatted pages that you can share with your Web users. These HTML Formatting Tools are the Output Formatter, the Data Set Formatter, and the Tabulate Formatter. On the graphics side, several new drivers are available for use with SAS/GRAPH software. These drivers (GIF and IMGGIF, GIF Animation, and IMGJPEG) are available with SAS Software and generate GIF (Graphics Interchange Format) files, animation using GIF images, and JPEG images. Once images have been created, they can be used on Web pages to enhance reports and data. The Web Publishing Tools are offered as is. For more information see Web Publishing Tools.

- **IBM TCP/IP HPNS Support:** TS455 also includes a SAS/C socket library upgrade that enables the SAS System to exploit the new High Performance Native Socket Support (HPNS) interface of IBM TCP/IP 3.2. This increases overall system efficiency because IBM TCP/IP no longer causes SAS/CONNECT and SAS/SHARE address spaces to be marked non-swappable during network I/O wait. It also reduces the CPU burden on the SAS address spaces and on the IBM TCP/IP system address space.

- **Enhanced Macro Facilities** offer several enhancements to the macro facility within Base SAS software. These include a new macro statement **%SYSCALL**, that provides the ability to access SAS **CALL** routines and SAS/TOOLKIT user-written **CALL** routines. Additionally, there are three new macro functions **%SYSEVALF** , **%SYSFUNC** , and **%QSYSFUNC** . The **%SYSEVALF** macro function does floating point evaluation, while **%SYSFUNC** and **%QSYSFUNC** macro functions provide macro facility interfaces to SAS functions and to functions written with SAS/TOOLKIT software.

- Included for debugging purposes, the **%PUT** macro statement has been enhanced to write macro variable names, scope, and values to the SAS LOG. Using the **%PUT** statement with one of the keywords **_ALL_** , **_AUTOMATIC_** , **_USER_** , **_LOCAL_** , or **_GLOBAL_** , gives macro programmers the ability to list relevant information for

debugging macro applications. The ability to write macro-generated text to both an external file and to the SAS LOG was ranked highly on recent SASWARE ballots.

- **Support for the CATALOG, FTP, and SOCKET Access Methods**, which allow the **CATALOG** , **FTP**, and **SOCKET** keywords to be used with the **FILENAME** statement, will be provided. The initial release of these access methods is experimental. This is a host-specific implementation and is not considered portable. Please see TSDOC 556 for the syntax of this MVS specific feature or by contacting SAS Technical Support directly.